

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An optical fiber comprising:

~~having on an end thereof an optically diffractive film~~ formed on an end portion of the optical fiber; ~~the optical fiber characterized in that:~~

~~the diffractive film includes a transparent DLC layer formed onto an end~~ included in said diffractive film, said transparent DLC layer being formed either onto the face of the optical fiber end portion, or onto an endface of a collimator joined to the endface of the optical fiber; and

~~the DLC layer includes a~~ diffraction grating included in said DLC layer, said diffraction grating containing local regions of relatively high refractive index and local regions of relatively low refractive index.

Claim 2 (currently amended): ~~The~~ An optical fiber as set forth in claim 1, ~~characterized in that the~~ wherein said diffractive film allows a single optical beam including a plurality of wavelengths to be split into a plurality of beams depending on the wavelength, and functions as a wavelength-division multiplexer/demultiplexer ~~that for causing can cause~~ a plurality of beams having different wavelengths to combine into a unitary optical beam.

Claim 3 (currently amended): ~~The~~ An optical fiber as set forth in claim 1, ~~characterized in that the~~ wherein said diffractive film allows a single-wavelength optical beam to be split into a plurality of beams, and functions as a power splitter/combiner ~~that can cause~~ for causing a plurality of single-wavelength beams to combine into a unitary optical beam.

Claim 4 (currently amended): ~~The~~ An optical fiber as set forth in claim 1, ~~characterized in that the~~ wherein said diffractive film has polarization-division multiplexer/demultiplexer functionality ~~that can separate, and cause~~ for separating, and causing to unite, TE waves and TM waves contained in a single-wavelength optical beam.

Claim 5 (currently amended): ~~The~~ An optical fiber as set forth in claim 1, ~~characterized in that the~~ wherein said diffractive film has wave-plate functionality with respect to either TE waves or TM waves contained in a single-wavelength optical beam.

Claim 6 (currently amended): An optical fiber comprising:
~~having on an end thereof an optically diffractive film~~ formed on an end portion of the optical fiber; ~~the optical fiber characterized in that:~~
~~the diffractive film includes~~ a first transparent DLC layer and a second transparent DLC layer included in said diffractive film and laminated in turn onto an

~~end~~ face of the optical fiber end portion, or onto an endface of a collimator joined to the endface of the optical fiber;

~~the first and second DLC layers each include~~ a first diffraction grating included in said first DLC layer, said first diffraction grating containing local regions of relatively high refractive index and local regions of relatively low refractive index;

a second diffraction grating included in said second DLC layer, said second diffraction grating containing local regions of relatively high refractive index and local regions of relatively low refractive index; wherein

the said first DLC layer has polarization-division demultiplexing functionality ~~that can split~~ for splitting by polarization TE waves and TM waves contained in a single-wavelength optical beam[[:]],

the said second DLC layer has wave-plate functionality with respect to either TE waves or TM waves contained in a single-wavelength optical beam[[:]], and

the said first and second DLC layers function interactively as an optical isolator.

Claim 7 (currently amended): The An optical fiber as set forth in claim 6, ~~characterized in that the~~ wherein said diffractive film is formed onto the endface of the optical fiber, and has a thickness of 20 μm or less.

Claim 8 (currently amended): An optical fiber as set forth in claim 7, ~~characterized in that~~ further comprising a connector for retaining the optical fiber end

portion ~~onto which~~ where the diffractive film is formed ~~is retained in a connector and~~
for abutting the fiber end portion against and connecting it to an endface of another
optical fiber.

Claim 9 (currently amended): ~~The~~ An optical fiber ~~set forth in any of claims 6~~
~~through 8, characterized in that~~ as set forth in claim 6, further comprising a
transparent interlayer ~~is inserted in between the~~ said first DLC layer and the said
second DLC layer.

Claim 10 (currently amended): ~~The~~ An optical fiber ~~set forth in any of claims 1~~
~~through 9, characterized in that the~~ as set forth in claim 1 or 6, wherein said
diffractive film includes the diffraction grating being functional with respect to light
containing wavelengths within a range of from 0.8 μm to 2.0 μm .

Claim 11 (currently amended): A method of manufacturing the an optical fiber
as set forth in any of claims 1 through 10 claim 1 or 6, the optical-fiber manufacturing
method ~~characterized in that~~ comprising a step of forming the high refractive-index
regions contained in the diffraction grating(s) ~~are formed~~ by irradiating the said DLC
layer(s) in a predetermined pattern with an energy beam to raise the refractive index
of the layer(s).

Claim 12 (currently amended): A method of manufacturing the optical fiber set forth in claim 9, the optical-fiber manufacturing method ~~characterized in~~ comprising steps of:

depositing ~~the~~ said first DLC layer onto the endface of the optical fiber, or onto the endface of the collimator joined to the endface of the optical fiber;

forming said high-refractive index regions in the first DLC layer by irradiating it with an energy beam to raise its refractive index in a first predetermined pattern;

depositing ~~the~~ said transparent interlayer and ~~the~~ said second DLC layer in turn; and

forming said high-refractive index regions in ~~the~~ said second DLC layer by irradiating it with an energy beam to raise its refractive index in a second predetermined pattern; wherein

when ~~the~~ said second DLC layer is being irradiated in ~~the~~ said second predetermined pattern with an energy beam, ~~the~~ said transparent interlayer acts to prevent the energy beam from having an effect on ~~the~~ said first DLC layer.

Claim 13 (currently amended): ~~The~~ An optical-fiber manufacturing method as set forth in claim 11 ~~or 12, characterized in that,~~ wherein the energy beam is selected from an X-ray beam, an electron beam, or an ion beam.

Claim 14 (currently amended): ~~The~~ An optical-fiber manufacturing method as set forth in ~~any of claims 11 through 13, characterized in that the~~ claim 11, wherein said DLC layer(s) ~~are~~is deposited by a plasma CVD technique.

Claim 15 (new): An optical-fiber manufacturing method as set forth in claim 12, wherein the energy beam is selected from an X-ray beam, an electron beam, or an ion beam.

Claim 16 (new): An optical-fiber manufacturing method as set forth in claim 12, wherein said first and second DLC layers are deposited by a plasma CVD technique.